DOCUMENT RESUME

ED 043 720 UD 010 682

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TITLE	Psycholinguistic Abilities of Good and Poor Reading First Grade Disadvantaged Pupils. IMRID Papers and Reports.
INSTITUTION	George Peabody Coll. for Teachers, Nashville, Tenn. Inst. on Mental Retardation and Intellectual Development.
SPONS AGENCY	National Inst. of Child Health and Human Development (NIH), Bethesda, Md.
PUB DATE	69
NOTE	11p.
EDRS PRICE	EDRS Price MF-$0.25 HC-$0.65
DESCRIPTORS	*Disadvantaged Youth, *Elementary Education, Elementary School Curriculum, Initial Teaching Alphabet, Language Ability, Language Instruction, *Perceptually Handicapped, Phonics, *Psycholinguistics, *Reading Instruction, Teaching Methods
IDENTIFIERS	Illinois Test Psycholinguistic Abilities, Metropolitan Achievement Tests

ABSTRACT

This study contrasted the psycholinguistic abilities of good and poor readers from disadvantaged backgrounds after completion of the first grade, using the Illinois Test of Psycholinguistic Abilities. It was predicted that disadvantaged children classified as poor readers would be significantly inferior to those identified as good readers on measures of psycholinguistic ability. The subjects were selected from a population of disadvantaged first-graders in Nashville, Tennessee. One group of subjects was taught to read using the Initial Teaching Alphabet; and the other, using traditional orthography. The subjects were divided into poor readers or good readers, depending upon their scores at the end of first-grade on the Metropolitan Achievement Tests. It was found that the prediction that poor readers would be significantly inferior to good readers on psycholinguistic abilities was partially supported; however, some findings were not consistent. These might be attributed to salient differences between the two reading methods. The results suggest the presence of general deficits in the auditory receptive and vocal expressive abilities of poor reading children. It appears that remediation exercises for such children should focus principally upon improving these abilities in both the syntactical and automatic aspects of language. (Author/JW)

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ED043720

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UD010682

IMRID PAPERS AND REPORTS

1969

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Psycholinguistic Abilities of Good and Poor Reading First Grade Disadvantaged Pupils[1]

by
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The student who fails to make normal progress in the development of early reading skills has long served as a focal point of concern to both the psychologist and educator. Surveys of school populations indicate that the prevalence of children with reading difficulty ranges between 10 and 30 percent (Austin, Bush, & Huebner, 1961; Harris, 1961; Malmquist, 1958). The problem of reading failure among children of low socioeconomic status is particularly acute. Inadequate reading ability among disadvantaged children is reported to be about four to ten times more prevalent than the rate reported for the rest of the school population (Chandler, 1966; Deutsch, 1966; Shepard, 1962).

Although numerous investigations have sought to identify the major correlates of reading disability (Johnson, 1957), few studies have been concerned with identifying the significant cognitive and linguistic correlates of inadequate reading ability. Some studies, however, have identified a number of intellective differences between good and poor readers, using the Wechsler Intelligence Scale for Children (Altus, 1956; Burks & Bruce, 1955; Graham, 1952; Hirst, 1960; Neville, 1961; Spache, 1957). The results of these studies generally indicate that poor readers are inferior on tasks which 1) are automatic in nature and involve memory, 2) are related directly to school achievement, and 3) involve the use of verbal symbols. Poor readers have been found to demonstrate relative strengths on tasks requiring understanding of meaningful visual material and a general ability to solve problems through the manipulation of objects (Neville & Bruininks, in press).

Recently, attention has also been devoted to identifying the psycholinguistic correlates of reading ability. Kass (1966) used the Illinois Test of Psycholinguistic Abilities (ITPA) and a number of other tests to assess the psycholinguistic characteristics of a group of 21 poor readers of normal intelligence (CA = 7-0 to 9-11). In comparison to the test norm groups, poor readers were found to be inferior on the Monroe Sound Blending Test, Mazes, Graham-Kendall Memory-For-Designs, and the Perceptual Speed subtest of the Primary Mental Abilities Test. On

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[1]The research reported herein was supported by a grant to George Peabody College for Teachers (HD 973) from the National Institute of Child Health and Human Development. The authors wish to acknowledge also the many helpful suggestions of Dr. Lloyd Dunn.

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subtests of the ITPA, the poor readers were inferior on the Auditory-Vocal Association and Visual-Motor Sequencing subtests, but demonstrated superiority on the Visual Decoding subtest. A comparison of the results with a clinical model of reading led Kass to suggest that poor readers might be deficient primarily in the ability to integrate elements into meaningful wholes.

Although little evidence has been obtained on the psycholinguistic characteristic of poor reading disadvantaged children, data obtained from studies of perception indicate that the disadvantaged are inferior to their more advantaged peers in auditory discrimination (Clark & Richards, 1966; Deutsch, 1964), and in auditory memory and sound blending (McConnell & Robertson, 1967). Studies have not determined, however, if deficiencies in basic perceptual and linguistic abilities occur in disadvantaged children in general, or if deficits on perceptual, cognitive, and linguistic measures are found only among those children who encounter difficulty in learning school tasks.

The present study contrasted the psycholinguistic abilities of good and poor readers from disadvantaged backgrounds after completion of the first grade, using the ITPA (McCarthy & Kirk, 1961). It was predicted that disadvantaged children who were classified as poor readers would be significantly inferior to those identified as good readers on measures of psycholinguistic ability.

Method

Subjects

The subjects were selected from a population of disadvantaged children who had attended the first grade in either 1964 or 1965, and participated in experimental reading and language development projects (Dunn & Mueller, 1966; Dunn, Neville, Bailey, Pochanart, & Pfost, 1967). The projects involved a total of 21 schools of the Nashville, Tennessee, Metropolitan School District. The children attending these schools lived in the slum and ghetto areas and were given low ratings on several indices of socioeconomic status (cf. Dunn et al., 1967).

One group of subjects was taught to read using the Initial Teaching Alphabet (ITA) Early-to-Read series (Mazurkiewicz & Tanyzer, 1963), while the other group was taught to read through traditional orthography (TO), using the Houghton Mifflin basal reading series (McKee, Harrison, McCowen, & Lehr, 1963). At the end of the first grade, the ITA and TO groups included 171 and 160 children, respectively. The children were all administered the Stanford-Binet Intelligence Scale (Terman &Merrill, 1960) toward the end of the first grade. Only those children with IQs between 90 and 110 were included in the present study. A total of 84 subjects in the ITA group and 61 subjects in the TO group were identified with IQs within this range.

Subjects in the ITA and TO reading groups were classified separately as "good" readers (GRs) or "poor" readers (PRs) if the mean of their reading grade equivalent scores on the Word Knowledge, Word Discrimination, and Reading subtests of the Metropolitan Achievement Tests (Durost, Bixler, Hildreth, Lund, & Wrightstone, 1959) was above the eightieth percentile or below the twentieth percentile for their respective groups. The achievement test was given toward the end of the first grade, or after the subjects had been exposed to either the TO or ITA approaches for approximately eight months. This resulted in groups of 10 GRs and 10 PRs who had learned to read by using TO, and 11 GRs and 11 PRs who had learned to read by using ITA. The good and poor reading groups were constituted so that each sample contained the same proportion of boys and girls.

A summary of the basic descriptive data on good and poor readers who had learned to read in either ITA or TO appears in Table 1. Inspecion of Table 1 indicates that the reading groups within both reading approaches were not significantly different on either IQ or CA.

Table 1

Summary of Basic Data

Measure	Good Readers $\bar{X}$	Good Readers S	Poor Readers $\bar{X}$	Poor Readers S	t
ITA Sample					
Reading	3.05	.48	1.48	.17	8.89*
Chronological Age[a]	82.45	4.74	80.54	2.81	1.10
Stanford-Binet IQ	96.82	6.68	95.54	2.88	.55
TO Sample					
Reading	2.20	.13	1.37	.36	6.92*
Chronological Age	81.50	3.24	82.00	6.93	.21
Stanford-Binet IQ	97.30	4.70	96.60	6.54	.28

[a]In months.

*$p < .01$

The GRs, however, were significantly superior in comparison to the PRs on overall reading achievement within both the ITA and TO reading groups ($p < .01$).

Instruments

Toward the end of the first grade, subjects in both the ITA and TO reading approaches were given the ITPA (McCarthy & Kirk, 1961). The ITPA provides a profile of nine separate language abilities and a total language age score for children between the ages of two to nine years. The subtests include meaningful or automatic (rote) language tasks which are presented to the subject via either the auditory or visual modality. The subtests are designed to measure receptive, expressive, or associational language abilities. The manual (McCarthy & Kirk, 1961) describes each of the subtests in the following manner:

1) Auditory Decoding measures the ability to comprehend the spoken word.

2) Visual Decoding measures the ability to comprehend pictures and written words.

3) Auditory-Vocal Association measures the ability to relate spoken words in a meaningful way (e.g., analogies).

4) Visual-Motor Association measures the ability to relate meaningful visual symbols.

5) Vocal Encoding measures the ability to express one's ideas in spoken words.

6) Motor Encoding measures the ability to express one's ideas in gestures.

7) Auditory-Vocal Automatic measures the ability to predict future linguistic events from past experience (e.g., the examiner says, FATHER IS OPENING THE CAN. NOW THE CAN HAS _____).

8) Auditory-Vocal Sequencing measures the ability to correctly repeat a sequence of symbols (digits) previously heard.

9) Visual-Motor Sequencing measures the ability to reproduce correctly a sequence of symbols previously seen.

Results

The ITPA subtest scores of the GRs and PRs within each reading method (i.e., ITA or TO) were compared statistically, using a Lindquist Type I analysis of variance (Lindquist, 1953).

ITA Reading Group

The analysis of variance on the psycholinguistic abilities of the GRs and PRs who had learned to read in ITA appears in Table 2. Table 2 indicates that the PRs were significantly inferior to the GRs on overall ITPA language performance. However, no significant differences were obtained between the nine subtests for the GRs and PRs combined, and the reading groups by ITPA subtests interaction was not significant.

Table 2

Analysis of the Psycholinguistic Profiles of Good and Poor Readers from the ITA Sample

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio
Between				
B (Reading Groups)	1	4840.600	4840.600	7.351**
Error	20	13170.700	658.535	
Within				
A (ITPA Subtests)	8	3221.100	402.638	1.870
A x B	8	1835.700	229.463	1.065
Error	160	34458.600	215.366	
Total	197	57526.700		

**p < .01

In order to more clearly assess the differences in performance between GRs and PRs, t-test comparisons were made between reading groups on each subtest. These analyses indicated that the PRs were significantly inferior to GRs on the Auditory Decoding ($p < .05$), the Auditory-Vocal Association ($p < .05$), the Auditory-Vocal Automatic ($p < .05$), and the Auditory-Vocal Sequencing ($p < .05$) subtests.

TO Reading Group

The analysis of variance on the psycholinguistic abilities of the GRs and PRs who learned to read in TO appears in Table 3. Again Table 3 indicates that the PRs were significantly inferior to the GRs on overall ITPA language performance. The comparison betweenthe nine subtests for the GRs and PRs combined was also statistically significant. Analysis of the subtest differences generally revealed that the GRs and PRs combined were strongest on the Auditory-Vocal Sequencing and Visual Decoding Subtests, but inferior on the Motor Encoding, Vocal Encoding, Auditory Decoding, and Auditory-Vocal Automatic subtests. The reading groups by ITPA subtest interaction did not reach statistical significance.

Table 3

Analysis of the Psycholinguistic Profiles of Good and Poor Readers from the TO Sample

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio
Between				
B (Reading Groups)	1	2479.100	2479.100	4.449*
Error	18	10030.700	10030.700	
Within				
A (ITPA Subtests)	8	7363.000	920.375	4.175**
A x B	8	887.100	110.888	
Error	144	31747.300	220.467	
Total	179	52507.200		

*$p < .05$

**$p < .01$

The t-test comparisons by subtest revealed that the PRs were significantly inferior to GRs only on the Auditory-Vocal Association ($p < .05$), and the Visual-Motor Association ($p < .05$) subtests.

Discussion

The prediction that PRs would be significantly inferior to GRs on psycholinguistic abilities, as measured by the ITPA, was partially supported. On total ITPA language performance, PRs were found to be significantly inferior to GRs under both the ITA and TO approaches. In order to identify the specific linguistic weaknesses of PRs, their performance was compared to that of GRs on each individual subtest of the ITPA. The comparisons found PRs in the ITA reading group significantly inferior to GRs on the Auditory Decoding, Aduitory-Vocal Association, Auditory-Vocal Automatic, and Auditory-Vocal Sequencing subtests. Within the TO sample, PRs were significantly inferior to GRs on only the Auditory-Vocal Association and Visual-Vocal Association and Visual-Motor Association subtests.

Interestingly, the differences in the psycholinguistic abilities of GRs and PRs were not consistent across the two reading methods. Among the children who learned to read in ITA, the PRs were found significantly inferior on all ITPA subtests which assessed language abilities involving the auditory sense modality. However, no differences emerged between GRs and PRs in the ITA sample in subtests requiring the visual and motor channels of communication. Among children learning to read in TO, however, PRs were inferior on two subtests--one involving the visual modality, while the other involved the auditory modality.

Interpretation of these discrepant findings is difficult. One possible explanation for the discrepancy is that the variant findings were an artifact of the differences in reading performance between the GRs and PRs within the two reading method groups. Inspection of Table 1 reveals that greater disparity existed between the mean reading scores of the GRs and PRs who had learned to read in ITA. Thus, failure to find as many psycholinguistic deficits among the PRs in the TO sample could be related to the fact that they were less inferior in comparison to GRs on overall reading performance.

Explanation of these disparate findings, however, might be attributed to salient differences between the two reading methods. A recent analysis of basal reading series indicates that the ITA Early-to-Read series places greater emphasis upon phonic training than does the Houghton Mifflin basal reading series (Chall, 1967). It is possible that the American ITA reading program with its emphasis on sound-symbol regularity, is more difficult for children with pronounced auditory deficits in contrast to these with visual deficits. Identifying the subtle subject characteristics which interact with

varying approaches to teaching reading represents an area of inquiry requiring greater exploration. However, the degree to which subject characteristics interacted with the approaches to reading instruction used in the present study is difficult to assess.

The results of the present study suggest the presence of general dificits in the auditory receptive and vocal expressive abilities of poor reading disadvantaged children who learned to read in ITA. The results of other studies, moreover, indicate that PRs as well as disadvantaged children in general display marked deficiencies in auditory receptive and/or vocal language abilities (Deutsch, 1964; Goetzenger, Dirks, and Baer, 1960; Kass, 1966; McConnell & Robertson, 1967; Weaver & Weaver, 1967). It appears that remediation exercises for PRs, particularly among the educationally disadvantaged, should focus principally upon improving their auditory receptive and vocal expressive abilities in both the syntactical and automatic aspects of language. Such a remediation program might include training in skills required to: 1) discriminate auditorily and subtle differences which exist between the phonemes of English speech, 2) synthesize or blend discrete phonemes into whole words (e.g., c-a-t), 3) solve verbal proglems (e.g., questions involving anologies, 4) comprehend verbal material through listening (e.g., words and sentences), and 6) recall verbal units presented in sequential order (e.g., digits and words). Implementation of a comprehensive auditory perception and language training as a readiness program for disadvantaged children with auditory deficits appears to be suggested by the findings of the present study.

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